

Kubodera was relied upon to teach an inkjet recording ink and an image forming method comprising a pigment and a compound of formula (I):  $R-X-(Y)_n-H$ . The Office Action acknowledged that Kubodera does not teach colored fine particles including an oil-soluble dye and an oil-soluble polymer.

Kimura was relied upon to allegedly teach a bivalent linking group having a hetero bond or the hetero bond in general formula (I) ("Kimura formula (I)") selected from the group consisting of an ether bond, an ester bond, a thioether bond, a thioester bond, a sulfonyl bond, an amide bond, an imide bond, a sulfonamide bond, a urethane bond, a urea bond, and a thiourea bond. The position of the Office Action was that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Kubodera with the disclosure of Kimura in order to create a more stable ink for printing.

Ishizuka '548 was relied upon to teach colored fine particles including an oil-soluble dye and an oil-soluble polymer, wherein the oil soluble polymer has a dissociable group. The Office Action's position was that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Kubodera with the disclosure of Ishizuka '548 in order to create a more stable ink for printing.

Applicants traverse the rejection. In particular, Applicants submit that there is no suggestion or motivation to combine these references with a reasonable expectation of success to accomplish the presently claimed invention, for the following reasons.

Kubodera discloses an aqueous ink containing a water-soluble dye and a compound of formula (I) ("a water-soluble polymer"). Kubodera teaches that its ink has good spreading

performance on a recording paper and free from the occurrence of ejection failure and irregular scattering (see the Abstract).

Claim 1 of the present application relates to an aqueous ink composition comprising (a) colored fine particles including (a-1) an oil-soluble dye and (a-2) an oil-soluble polymer and (b) a compound of the general formula (I):  $R-X-(Y)_n-H$ , in which R is a hydrophobic group or a hydrophobic polymer, X represents a divalent linking group having a hetero-bond, for example, thioether, Y represents a group including at least one structural units A, B, C, and D, and n is a number of 10-3,500. The compound of the general formula (I) is a water-soluble polymer which has a hydrophobic group at its terminal. See page 98, lines 1-9 of the specification. Thus, the aqueous ink of Claim 1 of the present application contains an oil-soluble dye, dispersed as oil droplets having a small particle diameter, and a water-soluble polymer. The aqueous ink has excellent dispersion stability and storability over a prolonged period.

Therefore, as the Office Action has acknowledged, the present invention is different from Kubodera's invention in that the present invention contains an oil-soluble dye, while Kubodera's invention contains a water-soluble dye.

Such difference is due to the different objects relating to the inclusion of the water-soluble polymer in the ink. In the present invention, the hydrophobic group at the terminal of the water-soluble polymer "can effectively prevent aggregation of the organic (oil) phase emulsified and dispersed in an aqueous medium" (page 98, lines 4-5 of the specification) and can "maintain the ink in a uniformly dispersed state" (page 98, line 9 of the specification).

In contrast, Kubodera describes that the hydrophobic group of the aqueous polymer “enhances the dispersion stability of the water-soluble dye more effectively when R of Formula (I) is a hydrophobic group such as an alicyclic group or an aromatic hydrocarbon group, or a hydrophobic polymer, by means of higher mutual solubility with the water-soluble dye” (page 7, paragraph [0031] of the specification).

Although the present invention and Kubodera’s invention contain the compound of formula (I) in common, the present invention was accomplished with a different background and motivation from Kubodera, and would not have been easily achieved by simply replacing the water-soluble dye of Kubodera’s invention with an oil-soluble dye as taught by Kimura or Ishizuka ‘548.

As to Kimura, as opposed to the allegation of the Office Action, Kimura formula (I) represents an oil-soluble dye, but does not teach X (of the general formula (I) of the present application), which is a bivalent linking group having a hetero bond. Kimura discloses an aqueous ink-jet ink composition comprising colored fine particles including an oil soluble dye and an oil soluble polymer. But, it does not provide a motivation or suggestion to replace water-soluble dye of Kubodera’s inkjet recording ink with its oil soluble dye.

Likewise, Ishizuka ‘548 discloses colored fine particles including an oil-soluble dye and an oil-soluble polymer. But, it does not suggest that oil-soluble dye and an oil-soluble polymer may be used together with the compound (I) as taught by Kubodera. Nor does Kubodera teach or suggest that the compound (I) can be used with an oil-soluble dye and an oil-soluble polymer, instead of a water-soluble dye.

The Office Action alleges that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Kubodera with the disclosure of Ishizuka '548 or Kimura in order to create a more stable ink for printing. However, Applicants submit that the Office Action has failed to provide grounds as to why it would have been desirable or why one skilled in the art would have been motivated to replace water-soluble dye of Kubodera with the colored fine particles of Kimura or Ishizuka '548, i.e., why such would have improved Kubodera's stability. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990); MPEP 2143.01. Further a statement that modifications of the prior art to meet the claimed invention would have been well within the ordinary skill of the art at the time the claimed invention was made because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993); MPEP 2143.01.

Therefore, it is respectfully requested that the rejection be withdrawn.

**B. Rejection of Claims 6 and 7 under 35 U.S.C. § 103(a)**

Claims 7 and 8 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kubodera, Ishizuka '548 and Kimura in further view of U.S. Patent Publication No. 2002/067,399 to Yabuki et al. ("Yabuki").

Kubodera, Ishizuka '548 and Kimura were relied upon to teach the ink of Claim 1, while Yabuki was relied upon to teach the ink wherein the oil soluble dye is contained in an amount of 0.5-50% by mass based on a total mass of the ink or wherein the oil-soluble polymer is contained in an amount of 10-500% by mass based on a mass of the oil soluble dye.

The Office Action alleged that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosures of Kubodera, Ishizuka '548 and Kimura with that of Yabuki in order to create a more stable ink composition. Applicants respectfully traverse.

As discussed above with respect to rejection of Claims 1-5, 9-19 and 21-24, the Office Action has failed to establish *prima facie* case of obviousness based on Kubodera, Ishizuka '548 and Kimura.

Kubodera, as the Office Action acknowledged, does not teach colored fine particles including an oil-soluble dye and an oil-soluble polymer. Although the present invention and Kubodera's invention contain the compound of formula (I) in common, the present invention was accomplished with a different background and motivation from Kubodera, and would not have been easily achieved by simply replacing the water-soluble dye of Kubodera's invention with an oil-soluble dye.

Kimura, as opposed to the allegation in the Office Action, does not teach X (of the general formula (I) of the present application), which is a bivalent linking group having a hetero bond. Kimura discloses an aqueous ink-jet ink composition comprising colored fine particles including an oil soluble dye and an oil soluble polymer. But, it does not teach an ink comprising

a water-soluble polymer. Nor does it provide a suggestion or motivation to replace water-soluble dye of Kubodera's inkjet recording ink with its oil soluble dye.

Likewise, Ishizuka '548 discloses colored fine particles including an oil-soluble dye and an oil-soluble polymer. But, it does not teach or suggest that oil-soluble dye and an oil-soluble polymer may be used together with the compound (I) as taught by Kubodera. Nor does Kubodera teach or suggest that the compound (I) can be used with an oil-soluble dye and an oil-soluble polymer, instead of a water-soluble dye.

Yabuki discloses an ink composition comprising an oil-soluble dye aggregate dispersed in a water-based medium. It is disclosed that a certain type of oil-soluble dye is used for this purpose. However, Yabuki does not provide any teachings or disclosures of a desirability of replacing the water-soluble dye of Kubodera with the colored fine particles of Ishizuka '548 or Kimura or the oil-soluble dye aggregate of Yabuki. The Office Action did not provide a reason why it would have been desirable to combine these references to attain the present invention, and has failed to identify any motivation to combine these references.

None of Kimura, Ishizuka '548 or Yabuki describes that the inks include a water-soluble polymer, which is the key element of the present invention.

The ink of the present invention has evidently achieved the greater part of its performance by the water-soluble polymer (i.e., the compound of formula (I)). See Tables 3 and 4 on pages 129-13 of the specification.

Therefore, applicants respectfully request that the rejection be withdrawn.

**C. Rejection of Claim 8 under 35 U.S.C. § 103(a)**

Claim 8 has been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kubodera, Ishizuka '548 and Kimura in further view of U.S. Patent Publication No. 2002/088,294 to Ishizuka et al. ("Ishizuka '294").

Kubodera, Ishizuka '548 and Kimura were relied upon to teach the ink of claim 1 while Ishizuka '294 was relied upon to teach the compound represented by formula (I) contained in amount of 1 to 50% by mass based on a mass of colored fine particles.

The Office Action alleges that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosures of Kubodera, Ishizuka '548 and Kimura with that of Ishizuka '294 in order to create a more stable ink composition.

Applicants respectfully traverse the rejection for the following reasons.

Applicants submit that the Office Action has failed to establish *prima facie* case of obviousness based on Kubodera, Ishizuka '548 and Kimura for the reasons as discussed above with respect to rejections of Claims 1-5, 9-19 and 21-24 and of Claims 6 and 7.

Kubodera, as acknowledged in the Office Action, does not teach colored fine particles including an oil-soluble dye and an oil-soluble polymer. Although the present invention and Kubodera's invention contain the compound of formula (I) in common, the present invention was accomplished with a different background and motivation from Kubodera, and would not have been easily achieved by simply replacing the water-soluble dye of Kubodera's invention with an oil-soluble dye.

Kimura, as opposed to the allegation in the Office Action, does not teach X (of the general formula (I) of the present application), which is a bivalent linking group having a hetero bond. Kimura discloses an aqueous ink-jet ink composition comprising colored fine particles including an oil soluble dye and an oil soluble polymer. But, it does not teach an ink comprising a water-soluble polymer (i.e., compound of general formula (I)). Nor does it provide a motivation or suggestion to replace water-soluble dye of Kubodera's inkjet recording ink with its oil soluble dye.

Likewise, Ishizuka '548 discloses colored fine particles including an oil-soluble dye and an oil-soluble polymer. But, it does not teach or suggest that oil-soluble dye and an oil-soluble polymer may be used together with the compound (I) as taught by Kubodera. Nor does Kubodera teach or suggest that the compound (I) can be used with an oil-soluble dye and an oil-soluble polymer, instead of a water-soluble dye.

Ishizuka '294 discloses an ink composition comprising an oil-soluble dye and a vinyl polymer, in which the vinyl polymer is formed from a certain monomer having a cyano group. Ishizuka '294 does not provide any teachings or disclosures of a desirability of replacing the water-soluble dye of Kubodera with the colored fine particles of Ishizuka '548 or Kimura or the composition of the oil-soluble dye and the vinyl polymer of Ishizuka '294. None of other references provide such teachings or motivations. The Office Action did not provide a reason why it would have been desirable to combine these references to attain the present invention and has failed to identify any motivation to combine these references.

Accordingly, it is respectfully requested that the rejection be withdrawn.



**D. Rejection of Claim 20 under 35 U.S.C. § 103(a)**

Claim 20 has been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kubodera, Ishizuka '548 and Kimura in further view of U.S. Patent No. 6,048,660 to Leppard et al. ("Leppard").

Kubodera, Ishizuka '548 and Kimura were relied upon to teach the ink of claim 1, while Leppard was relied upon to teach the structural unit D.

The Office Action alleged that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the invention of claim 1 with the disclosure of Leppard in order to provide for a stable ink composition.

Applicants respectfully traverse the rejection.

Applicants submit that the Office Action has failed to establish *prima facie* case of obviousness based on Kubodera, Ishizuka '548 and Kimura for the reasons as discussed above with respect to rejections of Claims 1-5, 9-19 and 21-24 and of Claims 6 and 7.

Kubodera, as the Office Action acknowledged, does not teach colored fine particles including an oil-soluble dye and an oil-soluble polymer. Although the present invention and Kubodera's invention contain the compound of formula (I) in common, the present invention was accomplished with a different background and motivation from Kubodera, and would not have been easily achieved by simply replacing the water-soluble dye of Kubodera's invention with an oil-soluble dye.

Kimura, as opposed to the allegation in the Office Action, does not teach X (of the general formula (I) of the present application), which is a bivalent linking group having a hetero

bond. Kimura discloses an aqueous ink-jet ink composition comprising colored fine particles including an oil soluble dye and an oil soluble polymer. But, it does not teach an ink comprising a water-soluble polymer (i.e., compound of general formula (I)). Nor does it provide a motivation to replace water-soluble dye of Kubodera's inkjet recording ink with its oil soluble dye.

Likewise, Ishizuka '548 discloses colored fine particles including an oil-soluble dye and an oil-soluble polymer. But, it does not teach or suggest that oil-soluble dye and an oil-soluble polymer may be used together with the compound (I) as taught by Kubodera. Nor does Kubodera teach or suggest that the compound (I) can be used with an oil-soluble dye and an oil-soluble polymer, instead of a water-soluble dye.

Leppard discloses a material having the structure of structural unit D of the present invention which can be used, alone or in mixtures with other initiators, as a photoinitiator or a photocurable composition. However, Leppard does not suggest the possible application of the material to the structural unit of a water-soluble polymer included in an ink used for ink-jet printing.

The Office Action did not provide a reason why it would have been desirable to combine these references to attain the present invention and has failed to identify any motivation to combine these references. Applicants submit that, as Claim 1 is not obvious from Kubodera, Ishizuka '548 and Kimura, and Leppard does not provide any suggestion or motivation to combine these references to render Claim 1 obvious, Claim 20, which is dependent from Claim 1, is not obvious either.

Accordingly, it is respectfully requested that the rejection be withdrawn.

**E. Rejection of Claims 25, 27, 29 and 34 under 35 U.S.C. § 103(a)**

Claims 25, 27, 29 and 34 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kubodera in view of Ishizuka '548 and U.S. Patent No. 6,509,125 to Ito et al. ("Ito").

Kubodera and Ishizuka '548 or Kimura<sup>1</sup> were relied upon to teach the ink of claim 1, while Ito was relied upon to teach colored fine particles including an oil-soluble dye and a photopolymerizable monomer.

The Office Action alleged that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the invention of claim 1 with the disclosure of Ito in order to provide for a stable ink composition.

Claim 25 of the present application relates to an aqueous ink composition comprising (a) colored fine particles including (a-1) an oil-soluble dye and a (a-2) photopolymerizable monomer and (b) a compound of the general formula (I):  $R-X-(Y)_n-H$ , in which R is a hydrophobic group or a hydrophobic polymer, X represents a divalent linking group having a hetero-bond, for example, thioether, Y represents a group including at least one structural units A, B, C, and D, and n is a number of 10-3,500.

---

<sup>1</sup> Applicants noted that, while the last paragraph of page 7 of the office action identifies Ishizuka '548 as a secondary reference, the second and third full paragraphs of page 9 state Kimura, not Ishizuka '548.

As discussed above, Kubodera teaches an aqueous ink-jet ink composition comprising a water-soluble dye and a compound of the general formula:  $R-(S-P)_n$ . However, it does not teach an ink comprising an oil-soluble dye, a photopolymerizable monomer and the compound of the general formula  $R-(S-P)_n$ .

Ishizuka '548 discloses that colored fine particles are prepared by adding to an aqueous phase an organic phase including an oil-soluble dye, emulsifying and dispersing a resultant mixture. But, it does not teach or suggest that oil-soluble dye and a photopolymerizable monomer may be used together with the compound (I) as taught by Kubodera. Nor does Kubodera teach or suggest that the compound (I) can be used with an oil-soluble dye and a photopolymerizable monomer, instead of a water-soluble dye. Kimura is as discussed above in this letter.

Ito is directed to a color filter and a liquid crystal display device having the color filter. The color filter has layers of a dye bound to a polymer. Applicants submit that Ito is not a proper section 103 reference because its technical field is not analogous to the present invention. *See In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992); MPEP 2141.01(a).

Furthermore, it appears that Ito teaches away from an ink jet method at Col. 1, lines 35-45, particularly lines 44-45. Ito also does not teach a compound of the formula (I).

The Office Action alleged that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Kubodera with the disclosure of Ishizuka '548 or Kimura in order to create a more stable ink for printing. Further, the Office Action alleged that it would have been obvious to ordinary skilled in the art to modify the

invention of Kubodera with the disclosure of Ito<sup>2</sup> in order to make a more stable ink for printing. However, none of the references provide a suggestion or motivation to replace the water-soluble dye taught by Kubodera with the oil-soluble dye and the photopolymerizable monomer of Ito with a reasonable expectation of success. Moreover, Ito is not an analogous prior art.

Therefore, it is respectfully requested that the rejection be withdrawn.

**F. Rejection of Claims 26, 29 and 33 under 35 U.S.C. § 103(a)**

Claims 26, 29 and 33 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kubodera, Ito and Kimura in further view of Ishizuka '548. Applicants respectfully traverse.

Kubodera, Ito, Kimura and Ishizuka '548 were discussed above.

For the same reasons as discussed above, Applicants submit that the Office Action has failed to establish *prima facie* case of obviousness of Claim 25 based on Kubodera, Ito, Kimura, and Ishizuka '548.

None of these references provides a suggestion or desirability to combine the teaching of Kubodera with those of Ito, Kimura and Ishizuka '548 to attain the invention of Claim 25 of the present application. The Office Action did not provide any reason why it would have been desirable to combine these references to attain the present invention and has failed to identify any motivation to combine these references. As Claims 26, 29 and 33 have all the limitations of

---

<sup>2</sup> The last paragraph of page 9 of the Office Action indicates "Ishizuka et al." Applicants believe that this is a typographic error of "Ito et al."

AONO et al.  
Appln. No. 10/765,929  
Response Under 37 CFR 1.111

Claim 25, which is not obvious over Kubodera, Ito, Ishizuka '548 and Kimura, Claims 26, 29 and 33 are not obvious from these references as well.

Accordingly, it is respectfully requested that the rejection be withdrawn.

**G. Rejection of Claims 30 and 32 under 35 U.S.C. § 103(a)**

Claims 30 and 32 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kubodera, Ito and Kimura in further view of Yabuki.

Kubodera, Ito, Kimura and Yabuki were discussed above.

For the same reasons as discussed above, Applicants submit that the Office Action has failed to establish *prima facie* case of obviousness of Claim 25 based on Kubodera, Ito and Kimura.

None of these references provides a suggestion or desirability to combine the teaching of Kubodera with those of Ito, Kimura and Yabuki to attain the invention of Claim 25 of the present application. The Office Action did not provide a reason why it would have been desirable to combine these references to attain the present invention and has failed to identify any motivation to combine these references. As Claims 30 and 32 include all limitations of Claim 25, which is not obvious from Kubodera, Ito and Kimura, Claims 30 and 32 are not obvious over these references as well.

Therefore, it is respectfully requested that the rejection be withdrawn.

AONO et al.  
Appln. No. 10/765,929  
Response Under 37 CFR 1.111

**H. Rejection of Claim 31 under 35 U.S.C. § 103(a)**

Claim 31 has been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Kubodera, Ito and Kimura in further view of Ishizuka '294.

Kubodera, Ito, Kimura and Ishizuka '294 were discussed above.

For the same reasons as discussed above, Applicants submit that the Office Action has failed to establish *prima facie* case of obviousness of Claim 25 based on Kubodera, Ito and Kimura.

None of these references provides a suggestion or motivation to combine the teaching of Kubodera with those of Ito, Kimura and Ishizuka '294 to attain the invention of Claim 25 of the present application. The Office Action did not provide a reason why it would have been desirable to combine these references to attain the present invention and has failed to identify any motivation to combine these references. As Claims 31 includes all limitations of Claim 25, which is not obvious from Kubodera, Ito, Kimura, and Ishizuka '294, Claim 31 is not obvious over these references as well.

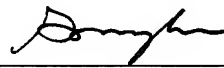
Therefore, it is respectfully requested that the rejection be withdrawn.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AONO et al.  
Appln. No. 10/765,929  
Response Under 37 CFR 1.111

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



---

Sunhee Lee  
Registration No. 53,892

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Date: March 27, 2006